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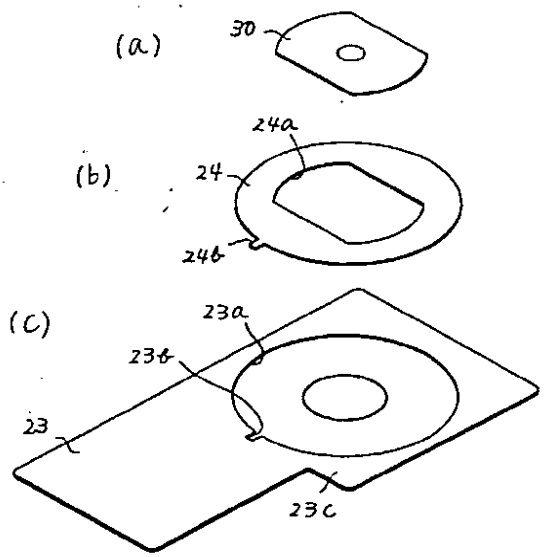
## (54) Printer with tray for recording media of different shapes

(57) The present invention is intended to provide an economical printer which is simple in structure and uses a common tray but is capable of adapting itself to various recording media of different shapes. Adapters in which recording media can be fitly held can be selectively mounted in the tray.

An adapter (24) has an oval opening (24a) in which a recording medium (30) can be fitted. The contour of the adapter (24) can fit into a recessed portion (23a) formed in the tray (23). The recording medium (30) is fitly held in the adapter (24). When the adapter (24) is mounted in the recessed portion (23a) in the tray (23), a keyway (23b) and a protrusion (24b) engaging the keyway (23b) prevent the adapter (24) from shifting out of position; the adapter is held in the tray (23). Prints can be made in accurate positions on the recording medium (30).

FIG.5

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## Description

[Detailed Description of the Invention]

[Technical Field to which the Invention Belongs]

**[0001]** The present invention relates to a printer and, more particularly, to a printer having a printing portion into which thick-walled recording media of various shapes (e.g., circular and rectangular shapes) such as compact disks (CDs) and smart cards are guided to print desired characters and symbols on the surfaces of the media; the media are then discharged to a discharge portion.

[Prior Art Techniques]

**[0002]** In recent years, a tray as shown in Fig. 8 has been used where prints are made on the surface of a recording medium such as a circular CD having a diameter of 120 mm. This tray *a* is provided with a circular recessed portion *c* having a diameter of 120 mm, and this CD *b* can fit into this recessed portion *c*. Where prints are made on the surface of the CD *b*, the CD *b* is fitted into the recessed portion *c*, and then the tray *a* is inserted from a tray guide installed in the supply path in the printer. The tray is thus sent into the printing portion, where printing is accomplished.

[Problems to be Solved by the Invention]

**[0003]** With the prior art tray as shown in Fig. 8, a slight error is normally produced between the contour of the CD *b* and the inside diameter of the recessed portion *c* because of manufacturing tolerance. Therefore, during printing, position deviation occurs, making it impossible to print in desired positions accurately. In the case of a noncircular recording medium such as a rectangular one, the aforementioned tray cannot adapt itself to the medium. Consequently, a separate tray having a recessed portion adapted for this contour must be prepared.

[Means for Solving the Problems]

**[0004]** To solve the foregoing problems, the present invention provides a printer having supply path for supplying recording media, a printing portion for making prints on the recording media, and a discharge portion for discharging each recording medium on which prints have been made, the printer being characterized in that each recording medium is supplied to the printing portion through the supply path while holding the recording medium to the tray and that an adapter in which the recording medium can be fitly held can be withdrawably installed in the tray. Therefore, the common tray can be used for various adapters. The printer can cope with recording media of various shapes simply by exchanging the adapter.

[Embodiment of the Invention]

**[0005]** A printer in accordance with the present invention comprises at least one supply path for supplying recording media, a printing portion for making prints on each recording medium, and a discharge portion for discharging each recording medium on which prints have been made by the printing portion. Each recording medium is supplied to the printing portion through the supply path while held to the tray. An adapter in which the recording medium is fitly held can be withdrawably installed in the tray.

**[0006]** Preferably, the above-described adapter has an opening in which a recording medium can be fitted. The adapter has a contour capable of fitting in a recessed portion formed in the tray. An engaging groove is formed in one of the adapter and tray, while the other is provided with a protrusion engaging the engaging groove to place the adapter in position circumferentially around the recessed portion.

**[0007]** Preferably, holes are formed on opposite sides of the opening in which the recording medium can be fitted. The adapter is resiliently deformed so as to shrink the holes, whereby the recording medium is resiliently held to the adapter. The adapter is resiliently incorporated in the tray.

**[0008]** Preferably, the aforementioned adapter is provided with a stop portion to prevent the recording medium from escaping toward its face. The tray is provided with a stop portion for inhibiting escape of the adapter toward a face of the recording medium.

[Example]

**[0009]** One example of the present invention is hereinafter described with reference to the drawings.

**[0010]** Figs. 1 and 2 schematically show the whole construction of a printer in accordance with the present invention. The printer has a first supply path 1 for supplying a recording medium 10 and a second supply path 2 for supplying a recording medium 20. The recording media 10 and 20 are supplied to a common printing portion 3 via their respective supply paths. After prints are made in the printing portion 3, the media are discharged to a common discharge portion 4.

**[0011]** The first supply path 1 can supply the recording medium 10 that is thin, such as paper, to the printing portion 3. The width $W_1$ of the path is set large. Recording paper is used as the recording medium 10. This recording medium 10 is placed on a cut sheet feeder (CSF) 11. A pair of CSF guides 12 and a pair of feed rollers 13 are positioned at both lateral ends of the sheet feeder 11. Frames 61 and 62 extend upright from a frame 6. A feed roller shaft 13a is rotatably held to the frames 61 and 62. The feed rollers 13 fit over the feed roller shaft 13a so as to be axially slidable but nonrotat-

able. The CSF guides 12 and the feed rollers 13 can be moved toward and away from each other axially of the feed roller shaft 13a. Thus, it is possible to cope with recording papers of various widths.

**[0012]** The cut sheet feeder 11 is tilted at an angle of about 45 degrees. Individual sheets of the recording medium 10 are pulled out by the feed rollers 13, guided to the top surfaces of a pair of guide plates 14, curved, and pulled in between a feed roller 15 located upstream of the printing portion 3 and an auxiliary roller 16 in resilient contact with the feed roller 15. Then, each sheet is supplied to the printing portion 3. Since the recording medium 10 is thin, slack tends to occur in the middle in the lateral direction. This tends to cause defective feeding operations such as wrinkles and oblique feeding. In this example, however, the guide plates 14, guide spring members (described later), and other components prevent slack. The top surfaces of the guide plates 14 have a given height and are shaped into tilted surfaces adapted to be smoothly guided to the printing portion 3. The feed roller 15 is firmly mounted to a feed roller shaft 15a rotatably held to the frames 61 and 62. The auxiliary roller 16 is rotatably mounted to a pin of an auxiliary roller support 17, which in turn is fixedly mounted to a frame 63.

**[0013]** The second supply path 2 has a width of $W_2$ as shown in Fig. 1. This width $W_2$ is set smaller in the center of the first supply path 1. This path 2 is used to supply the rigid recording medium 20 (e.g., a CD, a metal plate, a resinous plate, or the like) that is thicker than the recording medium 10. As shown in Fig. 2, the path 2 is formed by tray guides 21 formed on the top surface of the frame 6 such that the path runs straight into the printing portion 3.

**[0014]** As shown in Fig. 3, (a) and (b), the tray guides 21 are provided with slots 21a on both sides of its front-end portion, the slots extending in the direction of motion of the recording medium 20. Guide spring members 22 extend through the slots 21a, respectively, and have their parts located above the top surface. Each of the guide spring members 22 is made of a slender leaf spring member and has portions that are opposite to the slots 21a and bent into a V-shaped form. One end of the leaf spring material is mounted to the rear surface of each tray guide 21. The V-shaped portion is so shaped that its tilted surface 22a located on the side of the printing portion 3 is substantially identical in height and gradient to the tilted surfaces of the guide plates 14. The guide plates 14 and the guide spring members 22 are substantially aligned in the lateral direction at the intersection of the first supply path 1 and the second supply path 2.

**[0015]** As mentioned previously, the guide plates 14 and the guide spring members 22 are mounted at a given height, for the following reason. The recording media 10 and 20 are different in thickness and so the floor positions required for smoothly feeding each sheet of recording medium to the feed roller 15 and to the auxiliary roller 16 slightly differ at the intersection of the first supply path 1 and the second supply path 2. In particular, in the case of the thick-walled recording medium 20, the floor surface of the tray guides 21 must be made lower by an amount corresponding to the larger thickness of the medium 20. However, if the thin-walled recording medium 10 is sent with this low floor surface, it is likely that the medium is not neatly fed in between the rollers 15 and 16, producing incorrect feeding action. Accordingly, where the thin-walled recording medium 10 is sent, it is desired to feed the medium between the rollers 15 and 16 at a given height above the floor surface of the tray guides 21. The given height of the guide plates 14 and guide spring members 22 is set to such a value that the aforementioned requirement is best satisfied.

**[0016]** Where a circular CD that is one example of the recording medium 20 is supplied from the tray guides 21, a recessed portion 23a conforming in shape to the profile of the recording medium 20, i.e., a CD, is formed in the top surface of the rear half portion of a rectangular tray 23 made of a metal or resin, as shown in Fig. 4, (a) and (b). The CD 20 is fitted into the recessed portion 23a. The recessed portion 23a is provided with an engaging keyway 23b to stop rotation of an adapter (described later). The CD 20 is installed in the recessed portion 23a. The tray 23 has a front half portion in which one side portion is cut out. Its corner portion forms a sensor portion 23c.

**[0017]** The tray 23 set on the tray guides 21 advances while kept in a planar state as shown in Fig. 3(c) and distorts the guide spring members 22 downward. In the same way as in the case of the first supply path 1, the tray is pulled in between the feed roller 15 and the auxiliary roller 16 in resilient contact with the feed roller 15 and supplied to the printing portion 3. Since the tray guides 21 are narrower than the space between the guide plates 14, the tray 23 advances while distorting the guide spring members 22 downward as mentioned above without touching the top surfaces of the guide plates 14.

**[0018]** The aforementioned feed rollers 13 and 15 are rotationally driven by rotation of a motor $M_1$ shown in Fig. 1 via the feed roller shaft 13a and via the roller shaft 15a.

**[0019]** The printer portion 3 comprises a platen 31 elongated across the width of the printer and a print head 32 located opposite to the platen and capable of moving. The platen 31 is made stationary by the frames 61 and 62. The print head 32 is carried on a carriage 33, which is guided by a guide shaft 34 whose both ends are supported to the frames 61 and 64. The carriage is reciprocated by operation of an electric motor $M_2$ shown in Fig. 1. When the recording medium 10 or 20 supplied from the first supply path 1 or the second supply path 2 is passing across the gap between the platen 31 of the printing portion 3 and the print head 32, the print head 32 ejects ink at given timing commanded by an external

instruction, thus printing on the top surface of the recording medium 10 or 20.

**[0020]** The discharge portion 4 comprises a discharge roller 41 located downstream of the printing portion 3 and an auxiliary roller 42 in resilient contact with the discharge roller 41. The discharge portion discharges the recording medium on which prints have been made by the printing portion 3. The discharge roller 41 is pivoted to a discharge roller shaft 41a. The auxiliary roller 42 is rotatably coupled to the frame 65. The discharge roller 41 is rotated via the discharge roller shaft 41a by operation of the motor $M_1$ shown in Fig. 1.

**[0021]** A device 5 for detecting the position of the recording medium 10 or 20 is next described. As shown in Figs. 1 and 2, a light-transmissive type sensor 51, for example, is mounted to the frame 63. Since the supply or discharge of the recording medium 10 or 20 is detected by blocking and unblocking the optical path to this sensor 51, a lever 52 is interposed between the top surface of the passing recording medium 10 or 20 and the sensor 51. The lever 52 is swingably supported around its center. The lever has one end (top end) located opposite to the sensor 51 to permit the optical path to be blocked and unblocked. The other end (bottom end) is pushed up by supply of the recording medium 10 or 20, thus swinging the lever 52. Where none of the recording media 10 and 20 are present, the bottom end of the lever 52 is in a position where it touches the top ends of the tray guides 21. When the recording medium 10 or 20 passes, the bottom end of the lever 52 is pushed up, swinging the lever. This permits sensing operation of the sensor 51. Therefore, the machine is so set up that the height of the bottom end of the lever produces a sufficient difference between when either the recording media 10 and 20 is present and when no medium is present. The angle through which the lever 52 is swung is set large to permit stable detection of the sensor 51. Furthermore, it is necessary that either the recording medium 10 or 20 can pass across the lateral position of the lever 52. When the bottom end of the lever 52 is pushed up, if the recording medium does not slack, the stability of the detection is improved. Preferably, therefore, the bottom end of the lever 52 is close to the guide spring members 22 that support the recording medium 10 or 20 from below or is between each guide plate 14 and each guide spring member 22.

**[0022]** When the front end of the supplied recording medium 10 or 20 is detected by the sensor 51 via the lever 52, the print start position on the recording medium 10 or 20 is set. When the rear end of the recording medium 10 or 20 is detected, the print end position on the recording medium 10 or 20 is set. Also, the timing of discharge of the recording medium 10 or 20 is set.

**[0023]** Fig. 5 shows one used to make prints on an oval recording medium 30 as shown in (a). A tray that is identical with the tray 23 (Fig. 5(c)) that has been already described in connection with Fig. 4(b) is used. The recording medium 30 is set in the tray 23 via an adapter 24. As shown in Fig. 5(b), the adapter 24 is so shaped that it is centrally provided with an oval opening 24a in which the recording medium 30 can be fitted. The contour is circular so as to be capable of fitting into a recessed portion 23a. A protrusion 24b capable of being engaged in the engaging keyway 23b is formed on the outer surface of the adapter. Accordingly, the adapter 24 having the opening 24a in which the recording medium 30 has been fitted is fitted into the recessed portion 23a in the tray 23. The protrusion 24b is placed in the position of the engaging keyway 23b, and then the adapter 24 is fitted into the recessed portion 23a. Thus, the adapter 24 is placed in position circumferentially around the recessed portion 23a and locked in a given position on the tray 23. Consequently, the recording medium 30 held in this adapter is maintained in a posture necessary for printing. Since a printing operation is performed while maintaining this posture, prints can be made in correct positions on the recording medium 30.

**[0024]** Fig. 6 shows an example using other adapter 25 to hold the oval recording medium 30. The recording medium 30 and tray 23 shown in Fig. 6, (a) and (c), are the same as those described in connection with Fig. 5. The shape of the adapter 25 shown in Fig. 6(b) is described now. This adapter is centrally provided with an opening 25a in which the recording medium 30 can be fitted. The adapter has a circular contour capable of fitting into the recessed portion 23a, and a protrusion 25b capable of engaging the engaging keyway 23b is formed on the outer surface, in the same way as in the example of Fig. 5. In this example, substantially semicircular holes 25c are formed on the opposite sides of the opening 25a. Because of this geometry, opposite slender portions 25d and 25e are formed around the holes 25c. These slender portions 25d and 25e have resilience and can resiliently bend in the direction indicated by the arrow in Fig. 6(b), i.e., in the direction to contract the holes 25c. When the recording medium 30 is fitted in the opening 25a, the recording medium 30 is held in the adapter 25 without rattle by the resilient force of the slender portions 25d. When this adapter 25 is fitted in the recessed portion 23a, the adapter is held in the tray 23 without rattle by the resilient force of the slender portions 25e. The protrusion 25b is placed in the position of the engaging keyway 23b, and the adapter 25 is fitted into the recessed portion 23a, in the same way as in the case of Fig. 5. Accordingly, the recording medium 30 held in this adapter 25 is maintained in the given posture necessary for printing and held in position without rattle. Hence, prints can be made in correct positions on the recording medium 30 at all times.

**[0025]** Fig. 7 shows an example in which a further adapter is used to hold the oval recording medium 30. In particular, a tray 26 having the same contour as the foregoing has a recessed portion 26a in which an adapter 27 can be fitted. Engaging keyways 26b are

formed in two opposite locations on the inner surface of this concave portion. The engaging keyways 26b are so shaped that the wall of the top surface of the tray 26 is slightly left and that the keyways extend into the central thick-walled portions. The surfaces left in the top portions of the engaging keyways 26b form escape-preventing portions 26c. The adapter 27 fitted in the recessed portion 26a is similar in shape to the adapter shown in Fig. 6. The adapter is centrally provided with an oval opening 27a in which the recording medium 30 can be fitted. Protrusions 27b capable of engaging the engaging keyways 26b are formed on the outer surface. Substantially semicircular holes 27c are formed on the opposite sides of the opening 27a. Because of this geometry, opposite slender portions 27d and 27e are formed around the holes 27c. These slender portions 27d and 27e have resilience, in the same way as in the case of Fig. 6. In this example, thin-walled escape-preventing portions 27f protrude from parts of the slender portions 27d, respectively, in an opposite relation to each other. Accordingly, when the recording medium 30 is fitted in the opening 27a, the recording medium 30 is held in the adapter 27 without rattle by the resilient force of the slender portions 27d. At the same time, the escape-preventing portions 27f prevent the medium from escaping toward the face. When this adapter 27 is fitted in the recessed portion 26a of the tray 26, the adapter 27 is held in the tray 26 without rattle by the resilient force of the slender portions 27e. Simultaneously, the escape-preventing portions 26c prevent the recording medium 30 from escaping toward the face. The protrusions 27b are placed in the position of the engaging keyway 26b and the adapter 27 is fitted into the recessed portion 26a, in the same way as in the case of Fig. 5. Therefore, the recording medium 30 held in this adapter 27 is maintained in the posture necessary for printing and held without rattle. Furthermore, the medium does not escape toward the face. In consequence, prints can be made in correct print positions on the recording medium 30 at all times.

**[0026]** Since the machine is constructed in this way, if recording paper of width $W_1$ is supplied as the recording medium 10 from the first supply path 1, wide sheets of recording paper placed in the cut sheet feeder 11 are sent out one by one by the feed rollers 13. The front end of each sheet of the recording paper is guided by the tilted surface of each guide plate 14 and by the tilted surface 22a of each guide spring member 22. Thus, each sheet is pulled in between the feed roller 15 and the auxiliary roller 16 while curbing gently without slacking laterally or moving obliquely. At this time, the front end of each sheet of the recording paper pushes up the bottom end of the lever 52, swinging it. Therefore, the sensor 51 senses arrival of the sheet. As mentioned previously, each sheet of the recording paper is supported at a given height by the guide plates 14 and by the guide spring members 22 and so the sheet can withstand the upwardly pushing force applied to the bottom end of the lever and does not slacken. Hence, the sensor 51 can accurately perform the sensing operation.

**[0027]** Prints are made on the recording paper supplied to the printing portion 3 by the feed roller 15 and by the auxiliary roller 16 as described above. The paper is discharged by the discharge portion 4. When the rear end of the recording paper passes across the lever 52, it returns to its original state from the swung state. The sensor 51 returns to its non-detecting state.

**[0028]** Where narrow recording paper of width $W_2$ is supplied as the recording medium 10 from the first supply path 1, the feed rollers 13 on both sides are brought close to each other in conformity with the width of the recording paper. Individual sheets of the recording paper are sent out one by one. Since the recording paper is narrow, it is not guided by the tilted surfaces of the guide plates 14. Also, in this case, as shown in Fig. 3(b), the paper is guided by the tilted surfaces 22a of the guide spring members 22 of the tray guides 21 and, therefore, the paper can stand up to the force that tries to push up the bottom end of the lever 52. The paper does not slack. The sensor 51 can perform an accurate sensing operation. The subsequent operations are the same as those described previously.

**[0029]** Where prints are made on the top surface of the rigid recording medium 20 such as a CD, the second supply path 2 is used. In the case of a CD, the CD 20 is incorporated into the tray 23 shown in Fig. 4, placed on the top surfaces of the tray guides 21, and pushed into the printing portion 3. Since the top surface of the CD incorporated in the tray 23 has a sufficient height to swing the lever 52, the tray 23 advances within a plane while distorting the guide spring members 22 downward, as shown in Fig. 3(c). The sensor portion 23c of the tray pushes up the bottom end of the lever 52, swinging the lever. Therefore, the sensor 51 performs an accurate sensing operation. The subsequent operations are the same as those previously described.

**[0030]** When prints are made on the top surface of the oval recording medium 30, the second supply path 2 is also used. In this case, the recording medium 30 is fitted into the opening 24a or 25a in the adapter 24 or 25 shown in Fig. 5 or 6, respectively, and then the medium is mounted into the recessed portion 23a in the tray 23. After this tray 23 is placed on the top surfaces of the tray guides 21 and pressed toward the printing portion 3, the same operations are performed as the operations described above. In the example shown in Fig. 5, the adapter 24 does not move out of position circumferentially around the recessed portion 23a. Therefore, prints are made in correct positions on the recording medium 30. Furthermore, in the example shown in Fig. 6, the adapter 25 is held in position by the resilient force of the slender portions 25d and 25e. Hence, prints are made in correct positions on the recording medium 30 with improved stability.

**[0031]** Where prints are made on the top surface of the oval recording medium 30 by the example of Fig. 7,

the second supply path 2 is also used. In this case, the recording medium 30 is fitted into the opening 27a in the adapter 27 to prevent it from escaping toward the face of the recording medium 30. Then, the medium is fitted into the recessed portion 26a in the tray 26. The adapter 27 is held to the tray 26 such that it cannot escape toward the face of the recording medium 30. This tray 26 is placed on the top surfaces of the tray guides 21 and prints are made on the top surface of the recording medium 30 in the same way as the process described above. In this example, neither the adapter 27 nor the recording medium 30 shifts out of position circumferentially around the recessed portion 26a. Furthermore, they do not escape toward the face of the recording medium 30. In consequence, prints are made in correct positions on the recording medium 30 at all times.

[Effects of the Invention]

**[0032]** As described thus far, in the printer in accordance with the present invention, a tray in which an adapter can be withdrawably mounted is used, the adapter permitting a recording medium to be fitly held therein. Therefore, if adapters adapted to fitly hold recording media of different shapes are prepared, the printer can adapt itself to recording media of various shapes by a simple and economical structure using a common tray and a replaceable adapter.

**[0033]** An engaging groove or keyway is formed in one of the adapter and the tray. A protrusion engaging this engaging groove or keyway is formed on the other. The adapter is mounted in the tray while held in position. An opening is formed in the adapter. The adapter is resiliently mounted in the tray to prevent rattle. The recording medium is mounted to the adapter without shaking. If escape-preventing portions are formed on the adapter and on the tray to prevent the recording medium and the adapter from escaping toward the face of the recording medium, prints can be made in accurate positions on the recording medium. Hence, good print quality can be obtained.

[Brief Description of the Drawings]

**[0034]**

Fig. 1 is a schematic plan view of the whole construction of one example of the present invention, and in which a cut sheet feeder has been removed;
Fig. 2 is an enlarged cross section taken on line A-A of Fig. 1;
Fig. 3(a) is an enlarged perspective view of a tray guide;
Fig. 3(b) is an enlarged cross section of one spring portion of the tray guide;
Fig. 3(c) is an enlarged cross section of one spring portion of the tray guide, showing the manner in which a tray is being supplied;
Fig. 4(a) is a perspective view of a CD;
Fig. 4(b) is a perspective view of a tray in which the CD is incorporated;
Fig. 5(a) is a perspective view of a recording medium for use with another example of the invention;
Fig. 5(b) is a perspective view of an adapter in which the recording medium is held;
Fig. 5(c) is a perspective view of a tray in which this adapter is mounted;
Fig. 6(a) is a perspective view of a recording medium for use with a further example of the invention;
Fig. 6(b) is a perspective view of an adapter in which the recording medium is held;
Fig. 6(c) is a perspective view of a tray in which this adapter is mounted;
Fig. 7(a) is a plan view of a tray in which a recording medium and an adapter are mounted, showing a still other example of the invention;
Fig. 7(b) is a cross-sectional view taken on line B-B of Fig. 7(a);
Fig. 8(a) is a perspective view of a CD, showing the prior art structure; and
Fig. 8(b) is a perspective view of a tray in which this CD is mounted.

[Legend]

**[0035]**

| | |
|---|---|
| 2: | supply path; |
| 3: | printing portion; |
| 4: | discharge portion; |
| 20, 30: | recording media; |
| 23, 26: | trays; |
| 23a, 26a: | recessed portions; |
| 23b, 26b: | keyways; |
| 24, 25, 27: | adapters; |
| 24a, 25a, 27a: | openings; |
| 24b, 25b, 27b: | protrusions; |
| 25c, 27c: | holes; |
| 26c: | escape-preventing portions; |
| 27f: | escape-preventing portions |

**Claims**

1. A printer having supply path for supplying a recording medium, a printing portion for making prints on the recording medium supplied from said supply path, and a discharge portion for discharging the recording medium on which prints are made by said printing portion, said printer comprising:

   said recording medium being supplied to said printing portion from said supply path while held by a tray; and
   said tray in which an adapter capable of fitly

holding said recording medium therein being detachably mounted.

2. The printer of claim 1, wherein said adapter is provided with an opening in which said recording medium can be fitted and has a contour capable of fitting into a recessed portion formed in said tray, and wherein one of said adapter and said tray has an engaging groove or keyway while the other has a protrusion that engages said engaging groove to place said adapter in position peripherally around said recessed portion.

3. The printer of claim 2, wherein said adapter is provided with holes on opposite sides of said opening in which said recording medium can be fitted and resiliently deforms so as to shrink the holes, thus resiliently holding said recording medium to said adapter, and wherein said adapter is resiliently incorporated in said tray.

4. The printer of claim 2 or 3, wherein said adapter is provided with a stop portion for preventing said recording medium from escaping toward its face.

5. The printer of any one of claims 2-4, wherein said tray is provided with a stop portion for preventing said adapter from escaping toward a face of said recording medium.

# FIG.1

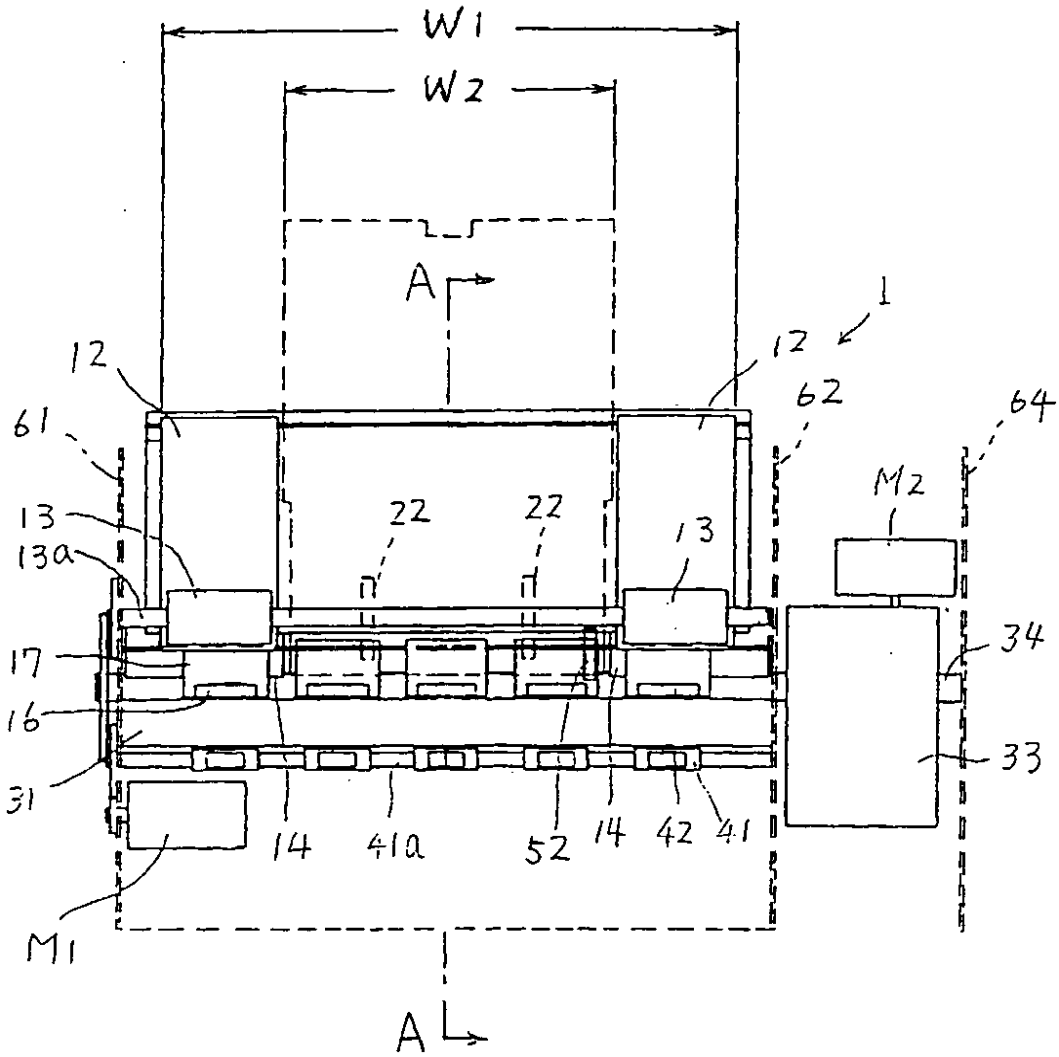
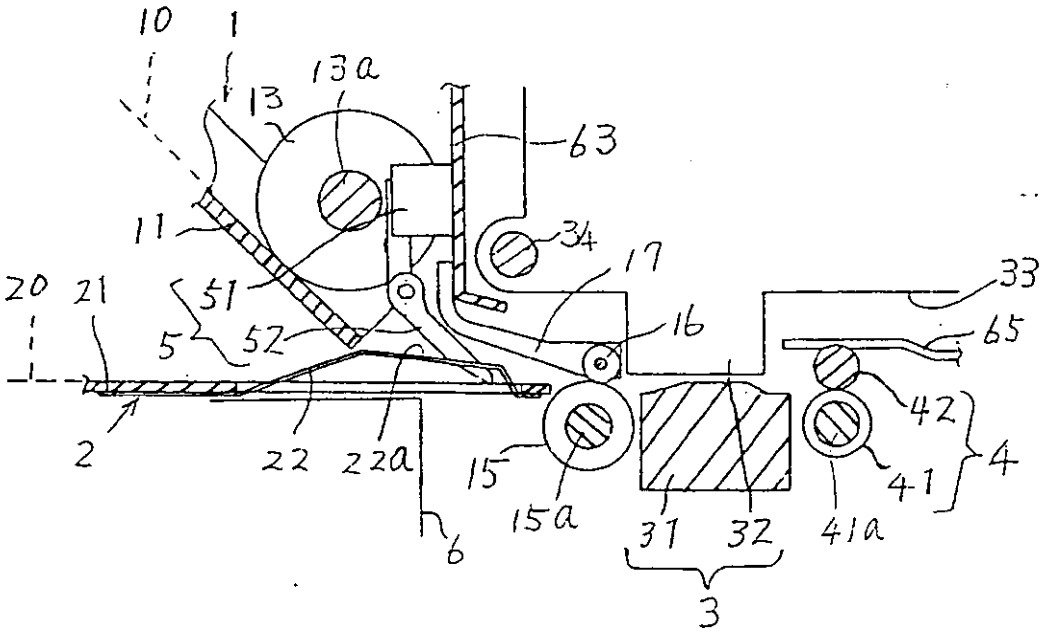


FIG.2


10
1
13a
13
63
11
34
17
33
20
21
51
5
52
16
65
42
2
22
22a
15
4
41
15a
31
32
41a
6
3

# FIG.3

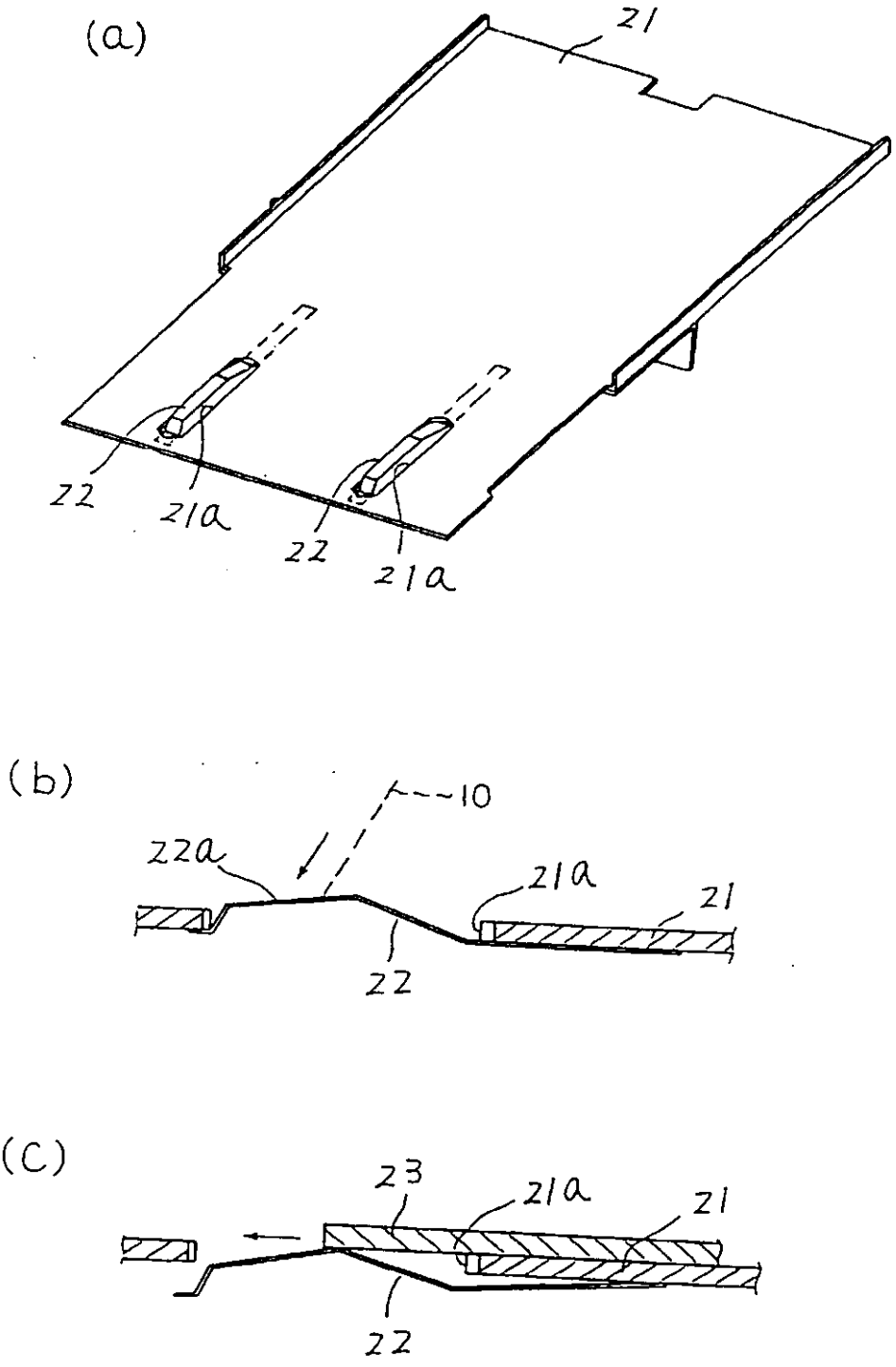


FIG.4

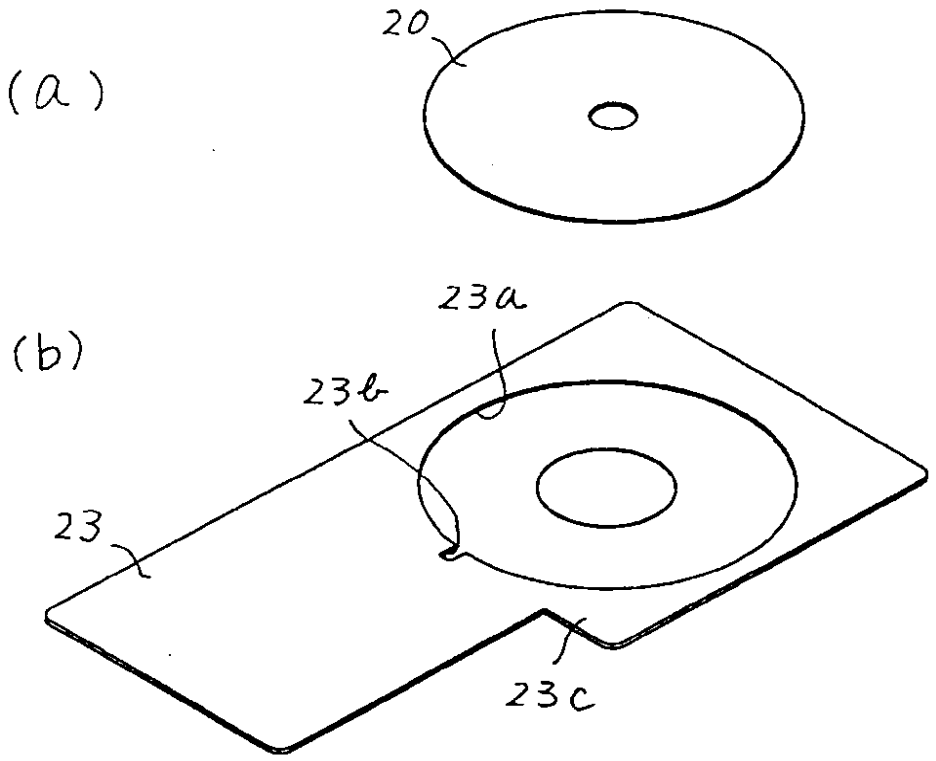


FIG.5

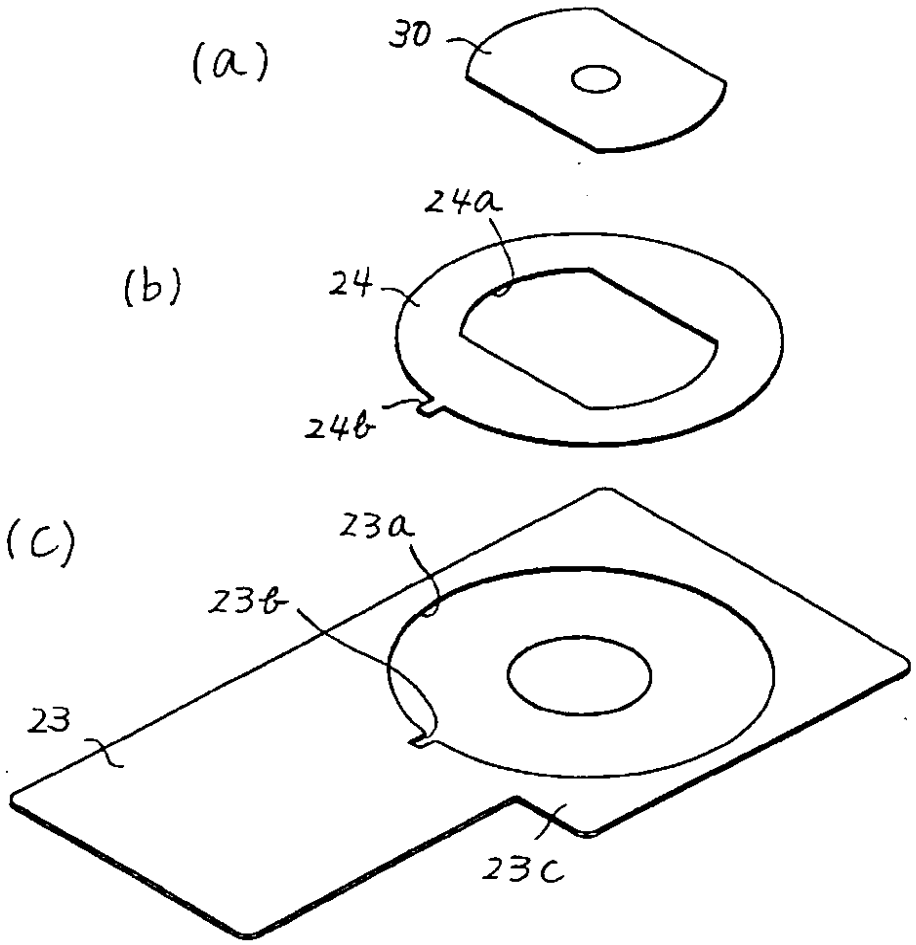


FIG.6

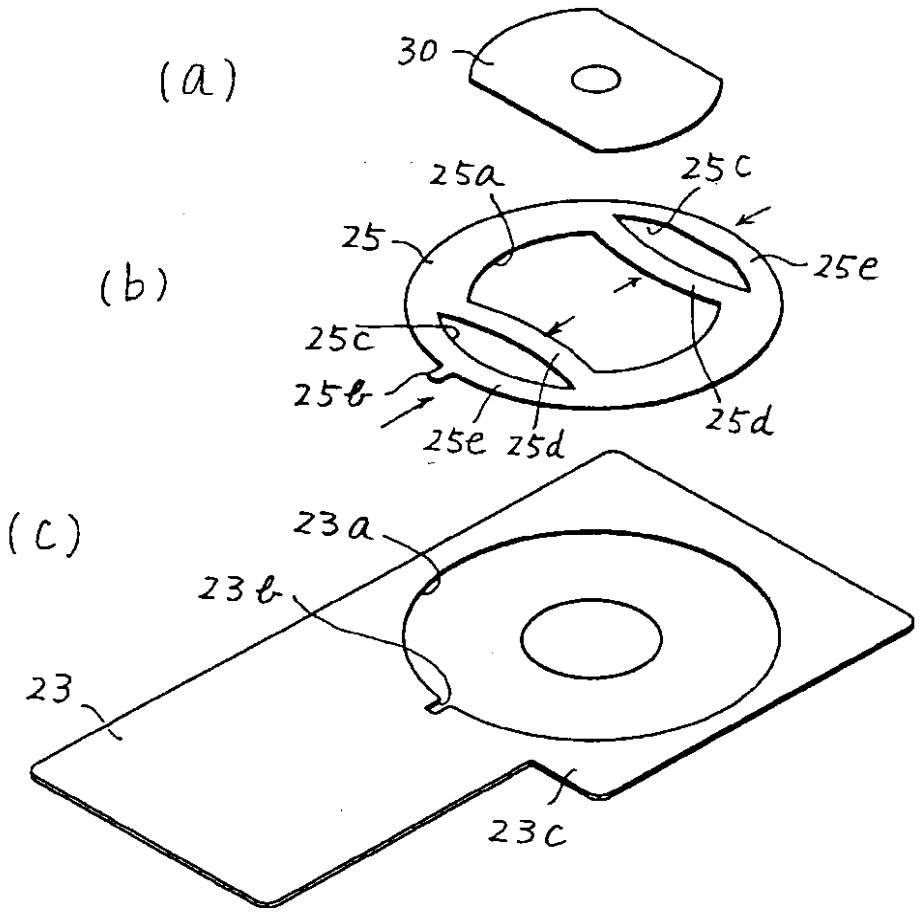


FIG.7

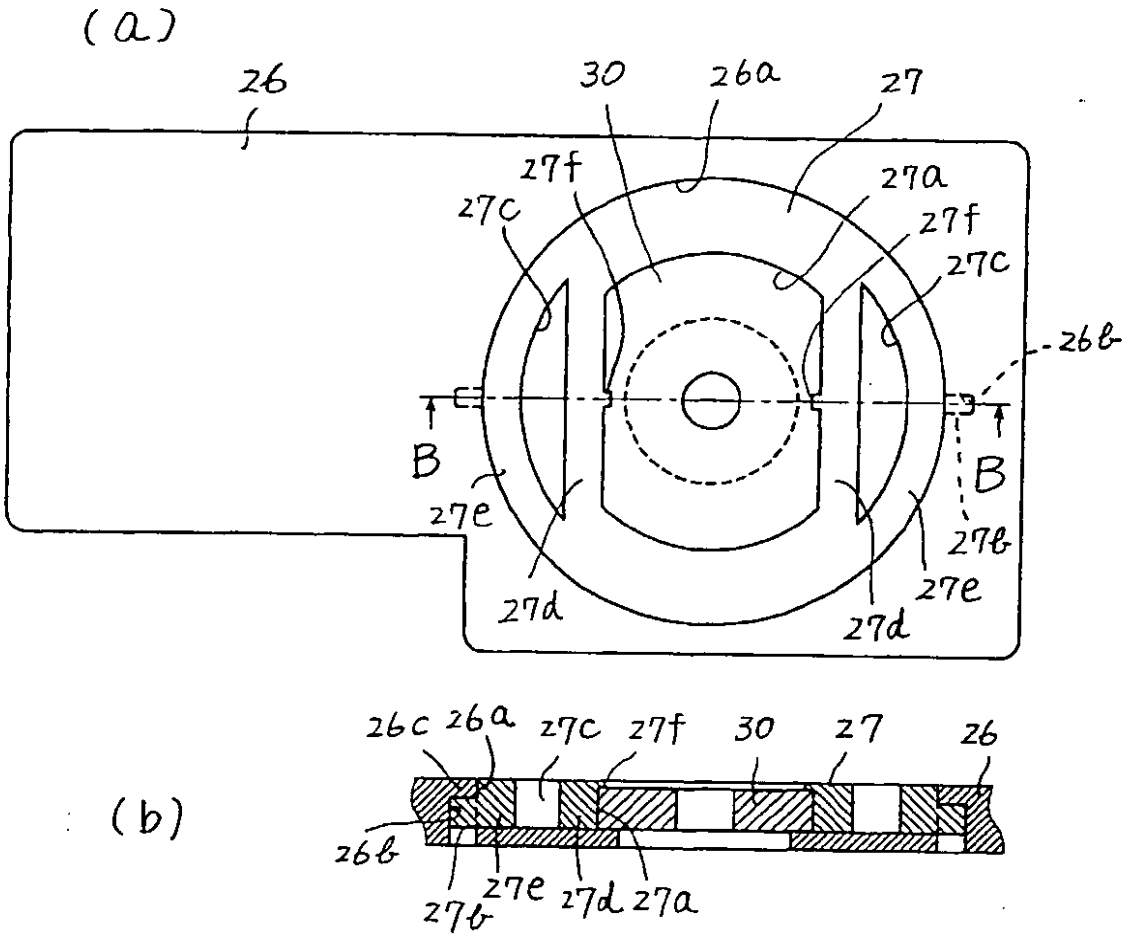
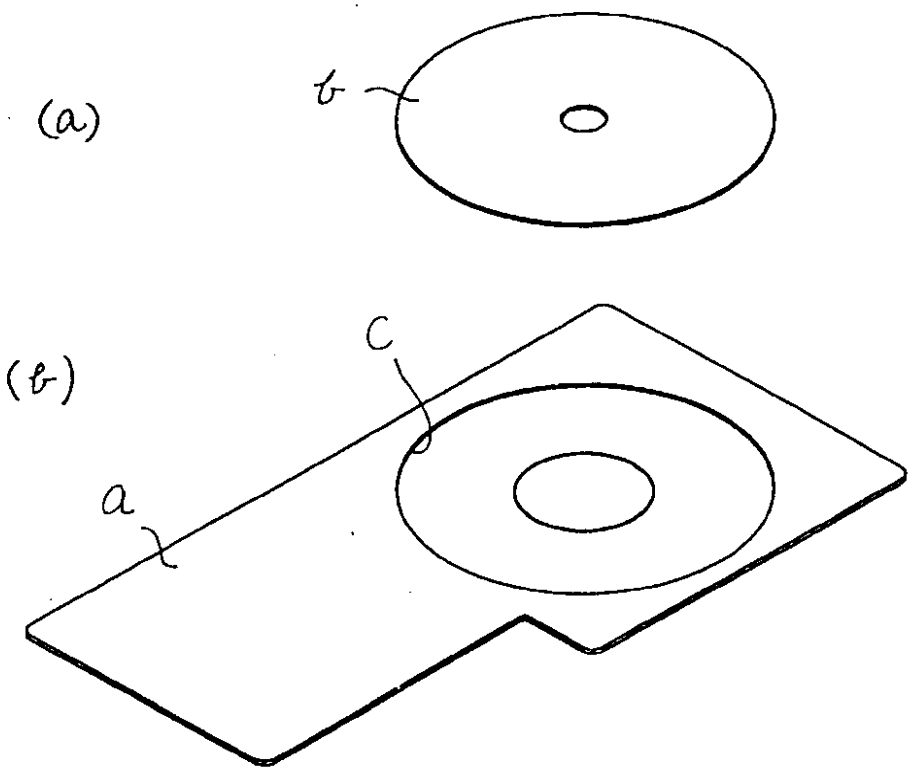


FIG.8



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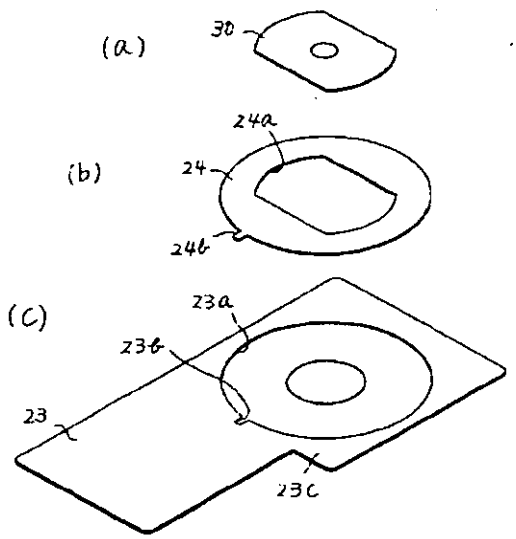
## (54) Printer with tray for recording media of different shapes

(57) The present invention is intended to provide an economical printer which is simple in structure and uses a common tray but is capable of adapting itself to various recording media of different shapes. Adapters in which recording media can be fitly held can be selectively mounted in the tray.

An adapter (24) has an oval opening (24a) in which a recording medium (30) can be fitted. The contour of the adapter (24) can fit into a recessed portion (23a) formed in the tray (23). The recording medium (30) is fitly held in the adapter (24). When the adapter (24) is mounted in the recessed portion (23a) in the tray (23), a keyway (23b) and a protrusion (24b) engaging the keyway (23b) prevent the adapter (24) from shifting out of position; the adapter is held in the tray (23). Prints can be made in accurate positions on the recording medium (30).

FIG.5

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# EUROPEAN SEARCH REPORT

Application Number
EP 00 11 1490

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| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
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|---|
| B41J |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| MUNICH | 5 September 2001 | Ziegler, H-J |

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